

Inventor: PICKFORD ET AL
Serial No. 10/591,793
Art Unit 1795

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Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1-12 (Cancelled)

13. (New) A titanium metal implant comprising a metal substrate for use in a surgical procedure, said implant having a surface layer integral with said metal substrate and incorporating a biocidal metal material, said implant comprising an anodized hard layer as said surface layer and including pits in said surface layer, said hard layer and said pits including ions of said biocidal metal material as a result of ion exchange, said pits including a softer and more porous material than said hard layer, with said hard layer having absorbed less biocidal metal material than the more porous material in said pits.

14. (New) A titanium metal implant according to claim 13, wherein titanium is present in said implant at least 75% by weight.

15. (New) A titanium metal implant according to claim 14, wherein said titanium is present as pure titanium or as a titanium alloy.

16. (New) A titanium metal implant according to claim 15 where other elements are present, selected from the group consisting of copper, tin, antimony, lead, bismuth and zinc.

17. (New) A titanium metal implant according to claim 13, wherein an oxide or phosphate oxide matrix is present at said

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surface layer of said metal substrate.

18. (New) A titanium metal implant according to claim 17, wherein biocidal metal ions are absorbed into said oxide or phosphate matrix.

19. (New) A titanium metal implant according to claim 18, wherein said biocidal metal material ions are selected from the group consisting of silver, gold, platinum, ruthenium and palladium.

20. (New) A titanium metal implant according to claim 13 wherein said hard layer is 0.14 micrometers thick.

21. (New) A titanium metal implant according to claim 20, wherein said hard layer includes pits having a diameter of approximately 5 micrometers and depth of approximately 0.4 micrometers.

22. (New) A titanium metal implant according to claim 21 wherein said pits make up between 15 and 20% of the surface area of said surface layer.

23. (New) A titanium metal implant according to claim 13, wherein said pits extend through said surface layer into said metal of said implant.

24. (New) A method of treating a titanium metal implant comprised of a metal substrate for use in a surgical procedure, said method including the steps of forming a surface layer integral with said metal substrate, anodising said implant for forming a surface layer thereon, performing ion exchange for incorporating ions of a biocidal metal into said

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surface layer, characterised in that said method comprises anodising said implant at a voltage above 50 volts for a period of at least 30 minutes for generating said surface layer, wherein the current density, the electrolyte concentration, the duration of anodising and the magnitude of the anodising voltage generate a dense hard surface layer and shallow pits in said surface layer wherein said pits are filled with a somewhat softer and more porous material.

25. (New) A method as claimed in claim 24 wherein said bio-cidal metal is silver.

26. (New) A method as claimed in claim 24 including the step of using an electrolyte comprising phosphoric acid during said anodising step.

27. (New) A method as claimed in claim 25 wherein said anodising step uses an electrolyte comprising phosphoric acid.

28. (New) A method as claimed in claim 26 wherein said phosphoric acid is of concentration between 5% and 20% by weight.

29. (New) A method as claimed in claim 24 wherein said electrolyte comprises chloride ions at a concentration no more than 500 ppm.

30. (New) A method as claimed in claim 25 wherein said electrolyte comprises chloride ions at a concentration no more than 500 ppm.